IN THE CLAIMS

Please amend claims 1, 14, 23, 36, and 38. Claims 45 and 46 have been withdrawn from consideration. Thus, claims 1-44 are pending upon entry of this amendment.

1. (Currently Amended) A method for detecting a non-nucleic acid compound of interest in a sample comprising the steps of:

a) providing a binding construct comprising a non-nucleic acid recognition portion which recognizes and binds said non-nucleic acid compound of interest without capture on a solid support, and a nucleic acid portion;

b) mixing said binding construct with said sample in a solution mixture to form construct-compound complexes in solution without capture on a solid support, wherein essentially all of said non-nucleic acid compound of interest in said sample becomes bound to said binding construct;

c) providing one or more surfaces, wherein said surface bears one or more accessible non-nucleic acid binding targets capable of recognizing and binding to said non-nucleic acid recognition portion of said binding construct;

d) introducing said one or more surfaces to said solution mixture of said construct-compound complexes after essentially all of said non-nucleic acid compound of interest in said sample has become bound to said binding construct ~~binding construct and said sample~~ in order for said one or more surfaces to form construct-surface complexes in solution with any and essentially all unbound binding constructs resulting in said solution mixture containing essentially said construct-compound complexes and said construct-surface complexes;

e) separating said construct-surface complexes from said solution mixture leaving behind said construct-compound complexes in solution; and

f) detecting the presence or absence of said nucleic acid portion of said binding construct in solution without captures on a solid support;

wherein the presence of said nucleic acid portion of said binding construct indicates the presence of said non-nucleic acid compound of interest in said sample.

2. (Original) The method of claim 1, wherein said one or more surfaces is selected from the group consisting of: particles, powders, beads, planar surfaces, non-planar surfaces, a tube, a well, non-porous films, non-porous membranes, porous films, porous membranes, fibers, fillers, meshes, grids, filters, matrices, gels, and combinations thereof.

3. (Original) The method of claim 1, wherein said one or more surfaces comprises particles.

4. (Original) The method of claim 3, wherein said particles comprise magnetic particles.

5. (Original) The method of claim 4, wherein said step (e) comprises separating said construct-surface complexes out of said mixture by means of a magnet.

6. (Original) The method of claim 1, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

7. (Original) The method of claim 1, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

8. (Previously Presented) The method of claim 7, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

9. (Previously Presented) The method of claim 5, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

10. (Previously Presented) The method of claim 5, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

11. (Previously Presented) The method of claim 10, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

12. (Previously Presented) The method of claim 1, wherein said non-nucleic acid recognition portion comprises a receptor.

13. (Previously Presented) The method of claim 1, wherein said non-nucleic acid recognition portion comprises an antigen.

14. (Currently Amended) The method of claim 1, wherein said non-nucleic acid recognition portion comprises ~~an antibody or~~ an antibody fragment.

15. (Previously Presented) The method of claim 1, wherein said non-nucleic acid recognition portion comprises a single chain antibody variable region fragment.

16. (Previously Presented) The method of claim 1, wherein said non-nucleic acid recognition portion comprises a Fab fragment.

17. (Previously Presented) The method of claim 16, wherein said Fab fragment is attached to said nucleic acid portion through the free sulfhydryl of the Fab fragment.

18. (Previously Presented) The method of claim 13 wherein said non-nucleic acid compound of interest comprises an antibody or antibody fragment, said non-nucleic acid recognition portion of said binding construct comprises an antigen that is recognized by said non-nucleic acid compound of interest, and said accessible non-nucleic acid binding targets comprise an antibody or antibody fragment that is capable of recognizing and binding to said non-nucleic acid recognition portion of said binding construct.

19. (Previously Presented) The method of claim 1, wherein said nucleic acid portion comprises DNA.

20. (Previously Presented) The method of claim 1, wherein said nucleic acid portion comprises RNA.

21. (Previously Presented) The method of claim 1, wherein said nucleic acid portion comprises a nucleic sequence that does not include a sequence that is expected to be found in the sample.

22. (Previously Presented) The method of claim 1, wherein said step (a) comprises providing two or more different types of binding constructs, wherein each of said two or more different binding constructs has a different non-nucleic acid recognition portion and a different nucleic acid portion.

23. (Currently Amended) A method for increasing the sensitivity of solution-phase detection of a non-nucleic acid compound of interest, comprising the steps of:

a) providing a sample suspected of containing said non-nucleic acid compound of interest;

b) providing a binding construct comprising:

i) a non-nucleic acid recognition portion capable of binding said non-nucleic acid compound of interest without capture on a solid support, and

ii) a nucleic acid portion

c) contacting said sample with said binding construct for a period of time sufficient to permit said non-nucleic acid recognition portion to bind said non-nucleic acid compound of interest present in said sample, thereby forming construct-compound complexes in solution, wherein essentially all of said non-nucleic acid compound of interest in said sample becomes bound to said binding construct;

d) providing one or more surfaces ~~surface~~, wherein said one or more surfaces bears one or more accessible non-nucleic acid binding targets ~~target~~ capable of binding to said non-nucleic acid recognition portion;

e) contacting said one or more surfaces with said solution after essentially all of said non-nucleic acid compound of interest in said sample has become bound to said binding construct for a period of time sufficient for said one or more accessible non-nucleic acid binding target to bind said non-nucleic acid recognition portion of any and essentially all binding construct not bound to said non-nucleic acid compound of interest, thereby forming construct-surface complexes in said solution resulting in said solution containing essentially said construct-complexes and said construct-surface complexes;

f) separating said construct-surface complexes from said solution, leaving said construct-compound complexes in said solution ; and

g) detecting the presence or absence of said nucleic acid portion of said binding construct in said solution without capture on a solid support,

wherein said separation of said construct-surface complexes from said solution results in a separation of <u>essentially</u> ~~substantially~~ all binding constructs not bound to a non-nucleic acid compound of interest and in an increased sensitivity of detection of said non-nucleic acid compound of interest, and
wherein the presence of said nucleic acid portion of said binding construct indicates the presence of said non-nucleic acid compound of interest in said sample.

24. (Previously Presented) The method of claim 23, wherein said one or more surfaces is selected from the group consisting of: particles, powders, beads, planar surfaces, non-planar surfaces, a tube, a well, non-porous films, non-porous membranes, porous films, porous membranes, fibers, fillers, meshes, grids, filters, matrices, gels, and combinations thereof.

25. (Previously Presented) The method of claim 23, wherein said one or more surfaces comprises particles.

26. (Previously Presented) The method of claim 25, wherein said particles comprise magnetic particles.

27. (Previously Presented) The method of claim 26, wherein said step (f) comprises separating substantially all said construct-surface complexes from said solution by means of a magnet.

28. (Previously Presented) The method of claim 23, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

29. (Previously Presented) The method of claim 23, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

30. (Previously Presented) The method of claim 29, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

31. (Previously Presented) The method of claim 27, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

32. (Previously Presented) The method of claim 27, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

33. (Previously Presented) The method of claim 32, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

34. (Previously Presented) The method of claim 23, wherein said non-nucleic acid recognition portion comprises a receptor.

35. (Previously Presented) The method of claim 23, wherein said non-nucleic acid recognition portion comprises an antigen.

36. (Currently Amended) The method of claim 23, wherein said non-nucleic acid recognition portion comprises ~~an antibody or~~ antibody fragment.

37. (Previously Presented) The method of claim 23, wherein said non-nucleic acid recognition portion comprises a single chain antibody variable region fragment.

38. (Currently Amended) The method of claim [[22]] 23, wherein said non-nucleic acid recognition portion comprises a Fab fragment.

39. (Previously Presented) The method of claim 38, wherein said Fab fragment is attached to said nucleic acid portion through the free sulfhydryl of the Fab fragment.

40. (Previously Presented) The method of claim 35, wherein said non-nucleic acid compound of interest comprises an antibody or antibody fragment, said non-nucleic acid recognition portion of said binding construct comprises an antigen that is recognized by said non-nucleic acid compound of interest, and said non-nucleic acid accessible binding targets comprise an antibody or antibody fragment that is capable of recognizing and binding to said non-nucleic acid recognition portion of said binding construct.

41. (Previously Presented) The method of claim 23, wherein said nucleic acid portion comprises DNA.

42. (Previously Presented) The method of claim 23, wherein said nucleic acid portion comprises RNA.

43. (Previously Presented) The method of claim 23, wherein said nucleic acid portion comprises a nucleic sequence that does not include a sequence that is expected to be found in the sample.

44. (Previously Presented) The method of claim 23, wherein said step (b) comprises providing two or more different types of binding constructs, wherein each of said two or more different binding constructs has a different non-nucleic acid recognition portion and a different nucleic acid portion.

45. (Withdrawn) A kit for detecting a compound of interest in a sample suspected of containing said compound of interest comprising:

a) a binding construct comprising

(i) a recognition portion which recognizes and binds said compound of interest, and

(ii) a nucleic acid portion;

and

b) one or more surfaces bearing one or more accessible binding targets capable of binding to said recognition portion of said binding construct.

46. (Withdrawn) The kit of claim 42, further comprising a nucleic acid amplification primer pair, wherein each primer of said primer pair is capable of hybridizing to its complementary sequence at the 3' end of a target nucleic acid sequence of said nucleic acid portion.